

What is claimed is:

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1. A tension member for providing lifting force to a car of an elevator system, comprising:  
a plurality of discrete cords, constructed from a plurality of individual wires, including wires less than .25 millimeters in diameter, said plurality of cords  
5 being arranged side-by-side;  
a coating layer substantially enveloping said plurality of cords and having an aspect ratio defined as the ratio of width  $w$  relative to thickness  $t$ , greater than one.
2. A tension member according to claim 1 wherein said plurality of wires are in a twisted pattern creating strands of several wires and a center wire.
3. A tension member according to claim 2 wherein said strand pattern is defined as said several wires twisted around said one center wire.
4. A tension member according to claim 1 wherein all wires are less than .25 millimeters in diameter.
5. A tension member according to claim 3 wherein said plurality of cords are each in a pattern comprising several strands around a center strand.
6. A tension member according to claim 5 wherein said cord pattern is several outer strands twisted around said center strand.

7. A tension member according to claim 6 wherein said center strand comprises said several wires twisted around said one center wire in a first direction and said outer strands each comprise said several wires twisted around said one center wire in a second direction and said outer strands are twisted  
5 around said center strand in said first direction.

8. A tension member according to claim 6 wherein each said center wire of each strand is larger than all wires twisted therearound.

9. A tension member according to claim 8 wherein said center wire of said center strand is larger than said center wire of each said outer strands.

10. A tension member according to claim 1 wherein said wires are in the range of about .10 millimeters to about .20 millimeters.

11. A tension member according to claim 6 wherein said center wire in said center strand is of a larger diameter than all other wires in each cord of said plurality of cords.

12. A tension member according to claim 1 wherein said cords are arranged in spaced relation to each other.

13. A tension member according to claim 1 wherein the aspect ratio is greater than or equal to two.

14. A tension member according to claim 1 wherein said coating layer defines a single engagement surface for the plurality of individual cords.

15. A tension member according to claim 14 wherein said coating layer extends widthwise such that the engagement surface extends about the plurality of individual cords.

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16. A tension member according to claim 1, wherein the sheave includes an engagement surface, and wherein the engagement surface of the tension member is contoured to complement the engagement surface of the sheave.
17. A tension member according to claim 14 wherein said engagement surface is shaped by an outer contour of said plurality of cords.
18. A tension member according to claim 3, wherein the coating layer is formed from an elastomer.
19. A tension member according to claim 14, wherein said engagement surface is contoured to complement an engagement surface of a sheave.
20. A tension member according to claim 1 wherein said coating layer is an elastomer.
21. A tension member according to claim 20 wherein said elastomer is a thermoplastic urethane.
22. A tension member according to claim 21 wherein said urethane is transparent.
23. A tension member according to claim 1 wherein said wire is metallic.

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24. ~~A traction drive for an elevator system, the elevator system including a car and a counterweight, the traction drive including a traction sheave driven by a machine and a tension member interconnecting the car and counterweight, the tension member having a width  $w$ , a thickness  $t$  measured in the bending direction, said tension member having a plurality of cords therein including wires of less than .25 millimeters in diameter, said tension member further having an engagement surface defined by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width  $w$  relative to thickness  $t$ , of greater than one, the traction sheave including a traction surface configured to receive the engagement surface of the tension member such that the traction between the sheave and tension member moves the car and counterweight~~

25. The traction drive according to Claim 24, wherein the tension member further comprises a common layer of coating encasing said plurality of cords, the coating layer separating the individual cords and defining the engagement surface for the tension member.

26. The traction drive according to Claim 24, wherein the traction surface is contoured to complement the engagement surface of the tension member such that traction between the traction sheave and tension member is enhanced.

27. The traction drive according to Claim 24, wherein the traction surface is contoured to complement the engagement surface of the tension member to guide the tension member during engagement with the traction sheave.

28. The traction drive according to Claim 24, wherein the traction surface includes a diameter  $D$ , and wherein the diameter  $D$  varies laterally to provide a guidance mechanism during engagement of the tension member and traction sheave.

29. The traction drive according to Claim 24, wherein the traction sheave includes a pair of retaining rims on opposite sides of the traction sheave.

30. The traction drive according to Claim 24, including a plurality of the tension members.

31. The traction drive according to Claim 30, wherein the traction sheave includes a traction surface for each tension member, and further includes one or more dividers that separate the plurality of traction surfaces.

Sub a 57 32. The traction drive according to Claim 24, further including a guidance device disposed proximate to the traction sheave, the guidance device engaged with the tension member to position the tension member for engagement with the ~~traction sheave.~~

33. The traction drive according to Claim 32, wherein the guidance device includes a roller engaged in rolling contact with the tension member.

34. The traction drive according to Claim 24, wherein the traction surface is formed from a non-metallic material.

Sub a 67 35. The traction drive according to Claim 29, wherein the cords are formed from a plurality of wires arranged in a plurality of strands, each strand having seven wires with six wires twisted around one center wire.

36. The traction drive according to claim 35 wherein said strands are arranged in a twisted pattern with six strands twisted around a center strand.

37. The traction drive according to Claim 25, wherein the coating layer is formed from elastomer.

38. The traction drive according to Claim 24, wherein the tension member further includes a coating layer that defines the engagement surface, and wherein the coating layer is formed from elastomer.

39. The traction drive according to Claim 34, wherein the traction surface is formed from polyurethane.

40. The traction drive according to Claim 24, wherein the maximum rope pressure of the load carrying ropes is approximately defined by the following equation:

$$P_{\max} = (2F/Dw)$$

Where F is the tension in the tension member and D is the diameter of the traction sheave.

41. The traction drive according to Claim 24, further including a sheave liner disposed about the traction sheave, wherein the sheave liner defines the traction surface.

42. The traction drive according to claim 24, wherein the traction surface is defined by a coating layer that is bonded to the traction sheave.

43. A traction device according to claim 36 wherein said center wire of said center strand in each individual cord is larger than all other wires in each individual cord while maintaining a diameter of less than .25 millimeters.

44. A traction device according to claim 36 wherein said center wire in each individual cord is larger than all other wires in each individual cord while maintaining a diameter of less than .25 mm.

45. A tension member according to claim 2 wherein said several wires and said center wire is seven wires.

46. A tension member according to claim 3 wherein said several wires is six wires.

47. A tension member according to claim 5 wherein said plurality of cords each comprise seven strands.

49. A tension member according to claim 48 wherein said center wire of each strand is larger than all wires twisted therearound.

~~50. A tension member according to claim 45 wherein said center wire of said center strand is larger than said center wire of each said outer strands.~~

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